stimulation", "stimulation occurring due to temporal fluctuation (temporal edge stimulation)", and "stimulation accentuating spatial fluctuation (spatial edge stimulation)". Further, with stimulation occurring at a normal matrix electrode, the number of electrodes it is possible to stimulate at a certain time is one. Here, considering the time it takes for stimulation, when, for example, the number of electrodes is 64, when just the same time is allocated to the three types of stimulation, the time taken is 64×3=192 stimulation time units. Specifically, one electrical stimulation pulse takes approximately 500 μs. If this remains as is, overall stimulation takes approximately 100 ms and the stimulation period becomes approximately 10 fps. A stimulation period of at least 50 fps and preferably in the order of 200 fps is required for tactile sensations and it is therefore necessary to reduce the time required for stimulation.

[Resolving Means 1 (Interlaced Scan)]

**[0080]** First, the same interlaced scanning as for a visual display is considered. Namely, at a certain stimulation period, just every other row, i.e. half of the electrode matrix is stimulated, and at the next stimulation period, the remaining half are stimulated. As a result, even if the whole stimulation period becomes slow, the perception of the user is that a multiple of the stimulation period is obtained. It is not necessary for this measure to be carried out every other line as with a visual display, and a method may be considered where, for example, black portions of a checkerboard are stimulated in the first half of a period, with white portions being stimulated in the second half of the period. Further, a scan for one time is divided into two here but dividing into numbers other than two (for example, four) can also be considered.

[Selecting Means 2 (Selecting Stimulation According to Type of Stimulation)]

**[0081]** Next, a method for implementing more important stimulations more emphatically is shown for one stimulation point as described above using three types of stimulation of "normal stimulation", "spatial edge stimulation", and "temporal edge stimulation". First, time that can be used in stimulation of all points is fixed. This is decided from the stimulation period. In the following example, the stimulation period is taken to be 50 fps, and the time used in stimulation of all of the points is taken to be 20 ms. When time required to stimulate one point one time is taken to be 500 μs, then it is possible to stimulate forty points in 20 ms. Further, the overall number of electrodes is 64. The degree of importance of the three types of stimulation described above is "normal stimulation">"spatial edge stimulation">"temporal edge stimulation". The limited time therefore has to be consumed in this order. During a period of 20 ms, a stimulation point is only stimulated a maximum of one time. For example, when it is decided to carry out "normal stimulation", "spatial edge stimulation" is not carried out during the same stimulation period. Namely, the stimulation selection algorithm decides "which point" is to be stimulated of the 64 points during the next 20 ms but does not decide "how many times" each point is to be stimulated. This is zero time or one time.

**[0082]** The following algorithm is effective.

**[0083]** (1) Normal stimulation: Stimulation is possible up to a maximum of 40 points. First, it is determined whether the number of points is greater than or less than 40 points.

**[0084]** (2) Selection takes place as is if there are 40 points or less.

**[0085]** (3) If there are more than 40 points, 40 points are selected in accordance with some kind of evaluation reference value and the selection algorithm is complete. For example, ensuring that stimulation is distributed by making weighting of points stimulated a lot in the past from stimulation history less can be considered as an evaluation reference value. Further, it is also possible to use intensity values of images taken with a camera in a visual-tactile conversion system using a camera.

**[0086]** (4) The number of points decided upon for stimulation up until now is taken to be N.

**[0087]** (5) Spatial edge stimulation: Candidate points for stimulation are selected, and it is determined whether or not the number of candidate points exceeds 40 or is 40 or less inclusive of the number of stimulation points N decided up to now.

**[0088]** (6) Selection takes place as is if there are 40 points or less.

**[0089]** (7) If 40 points is exceeded, it is ensured that the total number of stimulation points becomes 40 in accordance with some kind of evaluation reference value and the selection algorithm ends. For example, sharpness of spatial edge may be taken as an evaluation reference value to give candidates.

**[0090]** (8) The number of stimulation points up until now may be taken to be N.

**[0091]** (9) Temporal edge stimulation: Candidate points for stimulation are selected, and it is determined whether or not the number of candidate points exceeds 40 or is 40 or less inclusive of the number of stimulation points N decided up to now.

**[0092]** (10) Selection takes place as is when there are less points.

**[0093]** (11) If exceeded, it is ensured that the total number of stimulation points becomes 40 in accordance with some kind of evaluation reference value and the selection algorithm ends. For example, sharpness of temporal edge may be taken as an evaluation reference value to give candidates.

**[0094]** By using the algorithm described above, it is possible to ensure that the number of stimulation points does not exceed a certain number and it is possible to keep the stimulation period constant. Further, in this way, a method may be considered where, rather than carrying out processing in order every type of stimulation, first, evaluation reference values for all of the types of stimulation occurring at each point of the stimulation points are obtained. Next, total assigned weighting values for the evaluation reference values for each type are obtained at each point. Finally, the number of stimulation points is selected by sorting the total assigned weighting values.

[C] Mobile Tactile Display

**[0095]** In the present invention, a description is given based on a visual-tactile conversion system but the present invention may also typically be broadly applied to an electro-tactile display. The electro-tactile display can be made small and lightweight compared to a tactile display using other mechanical means and has the benefits of having high energy efficiency and being robust. In a preferred embodiment, the present invention may be applied to a mobile tactile display. The following technological ideas may also be adopted for